



**Montana Department of Transportation**  
**PO Box 201001**  
**Helena, MT 59620-1001**

**MEMORANDUM**

**To:** See Distribution  
**From:** Mark Wissinger, P.E.  
Construction Engineer  
**Date:** August 25, 2003  
**Subject:** Acceptance of Reinforced Concrete Products, and General Culvert Construction Considerations

As a result of reports from Districts and Construction Reviewers relating to an increase in the quantity of poor quality reinforced concrete boxes (RCB) and reinforced concrete pipe (RCP) being delivered to projects, Mac McArthur of the Construction Engineering Services Bureau gathered and summarized reports and photos from EPM's, Construction and Oversight Reviewers, and District Materials personnel. The purpose of this review was to quantify the extent and nature of the problem, identify areas of potential improvement in our acceptance of these products, and set out action items and the leads for these items that will be instituted to improve MDT's internal processes. After this was done MDT met with industry representatives to discuss our observations and corrective actions, and seek their input on the problems we had observed. The following are steps that MDT will take in response to the issues observed. The action items include inspection procedures with respect to pre-stressed concrete beams; beams were not specifically addressed in the afore mentioned review:

- The RCP, RCB and beam inspection reports will be reviewed to insure that they reflect the most current AASHTO specifications that govern acceptance. The forms will include an area for comments where the inspector at the plant will indicate observed defects that still fall within acceptance guidelines, or corrective actions taken to make them acceptable products. Billings District Materials Supervisor Bill Henning will take the lead on this item.
- The inspection sheet will be placed in pcommon in a Word format, and a message sent to the EPM for the project to receive the product, with the inspection report attached. Digital photos, if taken at the plant, will either be attached or placed in an accessible directory. Beam camber measurements are included on the beam inspection form, and will be sent out to the EPM and Bridge Bureau as soon as the project is done being poured. Billings District Materials Supervisor Bill Henning will establish this procedure. One supplier, Elk River Concrete, has indicated they will make computers available at both their Billings and Helena plants for this purpose.
- Defects that are noted in the plant inspection will be marked on the RCB, RCP or beam at the plant prior to shipment, as well as being noted in the inspection report. A standard method will be developed to stamp or otherwise indicate a particular product has been rejected, to prevent re-inspection or accidental shipment. Products will be stamped at a standard location. Bill Henning will take the lead on the item, developing a standard method for marking noted defects, and determining the most practical location to place stamps.

- A summary of governing AASHTO specifications will be developed and provided to field personnel charged with inspection and acceptance at the project site. Construction Reviewer Mark Baum will take the lead on this item.
- Pre-assembly and inspection of RCB sections and RCP with tie-bolt assemblies will be done at the plant prior to shipment. Elk River Concrete will provide a proposed procedure for the pre-assembly inspection. Kent Barnes, Materials Engineer, will approve the procedure.
- Inspection of materials will take place prior to placement on trucks for shipment.
- Help guides will be developed for RCP, RCB and steel culvert installations. We hope to have these help guides developed in time to be presented along with the culvert session planned for the training conference in January. Construction Engineering Services Engineer, Paul Jagoda is the lead on this item.
- Changes required to Specifications by the process changes will be identified and implemented by Lisa Durbin, Construction Administration Services Engineer.

The following issues were talked about in conjunction with the quality control issues previously noted. These points are for your general consideration:

- Any RCP greater than 900 mm (36") in diameter, and all RCB, are contract specific orders, meaning they are not generally kept in stock. For this reason it would be preferable to first stake, and confirm the lengths of, larger RCP and all RCB when possible. This would help reduce contract delays due to fabrication.
- The standard form length for RCB segments is 1800 mm (6'), and for RCP 2400 mm (8'). If there is not a safety, hydraulic, or other overriding issue that prevents doing so, we should try to stake and order pipe in these standard segment lengths.
- In steel, the longest lead-time required between ordering and delivery is for SSPP and SSPPA, which require approximately four weeks. Once again, if it is practical to do so, these installations should be staked first.
- CMP greater than 1350 mm (54") in diameter are match marked at the factory to assist in ease of installation.

I would like to thank all those who commented and sent pictures for the review. It is our hope that these steps will prove helpful. Please assist us in continuing to monitor the products and process to insure we are receiving what is required, and are communicating efficiently.

MW

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